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ABSTRACT

The two purposes of this study were to: (1) determine whether there had been an increase in the enrollment of returning women students (twenty-five years of age or older) between the fall of 1975 and the fall of 1976 at the Quad-Cities Campus, Black Hawk College. A second problem was to compare the mean grade point average achieved by these returning women students with the grade point average achieved by the rest of the student body. Enrollment data from the fall of 1975 were compared with the enrollment data of 1976, and the mean GPA of all returning women students and of the rest of the student body enrolled on the Quad-Cities Campus was computed by the data processing center. The results demonstrated that the enrollment of returning women students increased 2.2 percent while the overall student enrollment only rose 0.6 percent. The academic achievement of returning women students, as measured by the mean GPA, was significantly higher than the rest of the student body. This difference was significant at the .01 level. Recommendations included: (1) better scheduling of classes for women to increase student hours; (2) improved vocational counseling for women; (3) women should be encouraged to enter more courses traditionally reserved for males. Recommendations for further study included curriculum needs, delivery systems, and the effects of higher education on a woman's personal and social life. Statistical data are appended. (Author/LBH)

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THE INCREASING ENROLLMENT OF RETURNING WOMEN STUDENTS AND THEIR ACHIEVEMENT AS MEASURED BY THEIR MEAN GPA

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QUAD-CITIES CLUSTER

A PRACTICUM PRESENTED TO NOVA UNIVERSITY
IN PARTIAL FULLFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF EDUCATION

NOVA UNIVERSITY

November 29, 1976

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ABSTRACT

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Enrollment data from the fall of 1975 was compared with the enrollment data of 1976 and conclusions were drawn. Secondly, the mean GPA of all returning women students currently enrolled on the Quad-Cities Campus was computed by the data processing center. The mean GPA of the rest of the student body was then computed and a z test of the statistical significance at the .05 level was used to compare the data.

The results demonstrated that the enrollment of returning women students increased 2.2 percent while the overall student enrollment only rose 0.6 percent. The academic achievement of returning women students, as measured by the mean GPA, was significantly higher than the rest of the student body. This difference was significant at the .01 level.

Recommendations included: (1) better scheduling of classes for women to increase student hours; (2) improved vocational counseling for women; (3) women should be encouraged to enter more courses traditionally reserved for males. Recommendations for further study included curriculum needs, delivery systems, and the effects of higher education on a woman's personal and social life.

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INTRODUCTION

Nature of Community

A Self Study (1974:42) illustrates that the Quad-Cities Campus of Black Hawk College is located in a bi-state metropolitan area straddling the Mississippi River. The campus is in a standard metropolitan statistical area on the Illinois side of the river and there are three cities of moderate size: Rock Island, Moline and East Moline. The campus also serves many smaller communities, some having the relationship of suburbs to the larger metropolitan area.

The Quad-Cities Campus serves the major portion, 70 percent, of this standard metropolitan statistical area which has a total population of 219,951. The East Campus serves the remaining portion of this area. The U. S. Bureau of the Census (1972:17-271) revealed that 65 percent of this population area is eighteen years of age or older. The Census also showed that of this 65 percent, 44 percent, or 63,687, were females, twenty-five years of age or older.

For purposes of clarity and ease of handling, this study was limited to the 70 percent of the population served by the Quad-Cities Campus. This population includes approximately 44,600 women twenty-five years of age or older. The U. S. Bureau of the Census (1972:17-271) also revealed that only about six percent of these women have completed college, and only approximately nine percent have any college experience at all. Clearly, there is a large potential population of returning women students to be served in the Quad-Cities Campus area.

Major Community Needs or Issues Related to Study

The same societal factors affecting women on the national scene are influencing the lives of returning women students in the Quad-Cities Campus area.

1. The technological revolution has resulted in increased automation which has considerably lessened the amount of time a woman must spend in homemaking tasks.
2. The trend toward smaller families has significantly decreased the time women are spending for child rearing.
3. Automation, smaller families, and the women's movement have prompted more women to look outside the home for the development of additional interests.
4. The sharp growth of inflation has increased the amount of women who have to return to the labor force (Janeway, 1975).
5. The interrupted career patterns of many women necessitate the return to higher education for the updating of skills.
6. Toffler (1970) has illustrated that the rapid rate of social and technological change has resulted in a virtual "information explosion". Lifelong learning with an emphasis on teaching people how to learn seems to be the best solution. Increasingly, men and women will find it necessary to return to higher education throughout their lives. This will help them to "avoid getting stuck in occupational and educational ruts that lead to alienation and downright boredom" (Mondale, 1976:43).

Nature of Clientele

The vast majority of returning women students at Black Hawk College, fall within the age range of twenty-five to forty years of age. The majority are married with two or more children at home. A significant portion of these women -- 30 percent in day school, 20 percent in night school, and 47 percent in extension classes -- have children under six at home.

A considerable number of Black Hawk's returning women students are employed: 27.9 percent in day school, 72.7 percent in night school, and 44.4 percent in extension classes. Of the women who are employed, the majority are in full-time jobs.

Also, in the fall of 1975, the majority of returning women students had no college experience prior to enrolling at Black Hawk College. Although the largest number of returning women are enrolled as part-time students, a significant portion in day school, 42.6 percent, are enrolled on a full-time basis. (Beausang, 1976).

The clientele of returning women students being served by the Quad-Cities Campus present a complex picture. For the most part, they are an energetic group of women who are trying to combine the difficult roles of homemaker, employee, and student.

Importance of Study

A recent study, Beausang (1976:1), illustrated that females comprised 52.8 percent of the total student population enrolled in courses in degree programs on the Quad-Cities Campus. This same study also revealed that 41.9 percent of these women were twenty-five years of age or older. Also, 70.8 percent of the recent gains in

student population at Black Hawk College, up to the fall of 1975, were the result of increased enrollments of women.

In the light of a possible eight to ten percent overall decrease in student population for the fall of 1976 at the Quad-Cities Campus, it was significant to determine if there was a continuing increase in returning women students. During times of rapid social change it is particularly important for colleges to continually assess the changing nature of their various constituencies.

Black Hawk College, along with other community colleges in Illinois, is confronted with serious financial problems due to a newly developed and approved funding formula in the State of Illinois. The trend of increasing enrollments of women on the national scene, combined with the dramatic increases of women students at Black Hawk College over the past few years, should assist the institution in meeting the challenges of financial crisis and declining enrollments by presenting the possibility of cultivating a new student population. One source has aptly stated:

> In times of declining college enrollments, the non-traditional students, in particular older women, are economically popular because they offer a large new constituency and a new market for institutions of higher education. (Rice, 1975:242).

This practicum proposed to focus the attention of Black Hawk College on the growing phenomenon of returning women students, and the study also attempted to demonstrate the academic success of these students. Women are one of the major emerging forces in contemporary society, and as a <u>community</u> college, Black Hawk must assist them in their quest for equality.

THE PROBLEM

Mission Statement

One issue of this research project was to determine if there had continued to be an increasing enrollment of returning women students during the fall semester of 1976. A second problem was to compare the mean grade point average achieved by these returning women students with the grade point average achieved by the rest of the student body.

Objectives

It was anticipated that the objectives of this practicum would result in the following outcomes:

1. The first objective was to demonstrate that the enrollment of returning women students was continuing to increase at Black Hawk College.
2. The second objective, stated as a hypothesis, was to illustrate that the mean GPA achieved by returning women students was greater than the mean GPA achieved by the student body as a whole.
3. The first two objectives served to focus the attention of the college on the importance of returning women students as a valuable new constituency.
4. Finally, it was anticipated that this study would aid the college in becoming better attuned to a major social movement in our society.

REVIEW OF RELATED LITERATURE

According to the U. S. Department of Labor, Women's Bureau, (1971:3) between 1960 and 1973, the number of women aged twenty-five years or older in the labor force rose from 18.6 million to 25.5 million, a 39 percent increase, as compared to only an 8 percent increase for men in the same age group. During the same period the number of women students between the ages of twenty-five to thirty-four years increased threefold.

Winkler (1976:3) points out that national enrollments for the fall of 1975 were up 9.9 percent. The increasing enrollment of women was cited as one of the contributing factors. Over the last five years, the number of women in college has risen by 45 percent, compared to a 21 percent increase for men.

Magarrell (1976:3) notes that projected enrollment increases for the fall of 1976 over the fall of 1975 indicate that the enrollment of women will be up 5.5 percent, while the enrollment of men will be up 3.8 percent. Also, while four-year colleges will only increase 2.8 percent, two-year colleges will increase 7.9 percent.

These enrollment increases are occurring in spite of the degree of discrimination against women in higher education. "Although most educational leaders are aware of inequality of opportunity for women in higher education, many find it hard to get excited about the matter" (Cross, 1974:29). This discrimination and/or lack of concern was well illustrated when the Newman Task Force stated that "Our study found that discrimination against women, in contrast to that against minorities, is still overt and socially acceptable within the academic community" (Newman, 1971:80).

Research shows that women are still under represented in the college - going population. The most recent figures of the Census Bureau illustrate that male enrollments still outnumbered female enrollments at every age level (Winkler, 1976). The strongholds of male predominance at the undergraduate level are the private universities and the public community colleges. It is interesting that the greatest imbalance exists in the most selective and the least selective institutions (Cross, 1974).

The under representation of women at public community colleges might be partially explained by the predominance of lower socio-economic students at this level. According to Broomkin (1970) the mothers in the lower socioeconomic class are less apt to encourage their daughters to attend college. Also, the poor have somewhat earlier marriages and young women in low income families are apt to have more children than women in high income brackets (Davis, 1965). In addition, women are apt to marry earlier than men, "and marriage is a more important barrier to enrollment of women in higher education than it is for men" (Carnegie Commission, 1973:42).

In discussing societal factors, however, it is crucial to remember that all things are subject to change. As has been noted,

> With rising levels of parental education and real family income, the proportion of parents who are likely to be unenthusiastic about college education for their daughters is clearly declining. And sex differences in the relationship between marital status and college enrollment may be changing as more and more college-age young people are affected by a feeling that the burdens as well as the pleasures of child rearing should be shared more equally by parents than in the past (ibid., p. 42).

The enrollment of women in higher education has been adversely affected by several additional societal factors. These include:

acculturation practices that channel boys and girls into rigidly defined sex roles and occupations; sex biased testing and counseling that limit the career aspirations of girls while in high school; and discrimination in college admission procedures (Carnegie Commission, 1973).

Society has traditionally discriminated against women in the educational and professional areas, and studies have shown that even talented and educated women are affected by what has been labeled "a climate of unexpectation" (Cohen, 1971). This "climate of unexpectation" is particularly prevalent in higher education. For years the myth has existed that women were academically inferior to men, particularly in the areas of the natural sciences and mathematics. Current research, however, is rapidly dispelling this notion.

Two mutually inconsistent criticisms have seemed to work against adult women students because they are frequently enrolled on a part-time basis. (1) Part-time students' work is always inferior because of insufficient time given to the course. (2) It is relatively easy for a part-time student to obtain high grades because he or she can devote much time to one or two courses, or because it is easier to retain the content of a limited number of courses (Beagle, 1970).

However, Beagle has demonstrated that the commonly held belief among people in higher education that the adult or part-time student is a poor match for the regular student is contrary to the evidence. Beagle defined adult students as age twenty-five years and over, and her analysis revealed that the mean academic performance of adult students in general, and women adult students in particular, was significantly higher than that of the regular college-age students.

Her analysis was significant at the .01 level (Appendix, Document I).

Women students in general, regardless of age, receive higher grades in college than men. Research further illustrates that,

> It might be suspected that this tendency of women to receive higher grades is largely explained by their majoring in fields like the humanities and some of the so-called softer social sciences rather than in relatively rigorous fields requiring extensive use of mathematics, such as the sciences, engineering, economics, statistics, and mathematics itself. But this does not turn out to be the case. Women consistently receive higher grades than men in field after field, with a margin of between one-half of a grade point and a full grade point, depending on the field (Carnegie Commission, 1973:50-51).

Additional research further documents the academic superiority of adult women students. A study in the Faculty of Education, University of Alberta, noted that the 1968-69 grade point average for "mature students" was equal to (in the case of males) and greater than (in the case of females) that of the regular student body as a whole (Vaselenak, 1968). Stone (1975:17) notes that the director of admissions at Mills College said that resuming women had "the highest grade point average of anyone on campus." A study at the University of Cincinnati by Durchholtz and O'Conner (1973:52) illustrated that returning women students earned excellent grades and both full-time and part-time students had B averages.

Most educators agree that returning women students are strongly motivated and have a sincere desire to learn. Campbell (1972) said that the returning woman student usually has strong motivation, seriousness of purpose, persistence, and adaptability. Additional works, Margolis (1975) and Lowrey (1976) indicate that much of the academic success of returning women students is due to their high achievement motivation.

Two additional factors seem to be probable explanations for the superior academic achievement of women. First, women are more consistent than men in their academic performance in relation to both their ACT scores and their high school grade point averages. The performance of men is less consistent with what ACT scores would predict (Carnegie Commission, 1973). The net effect of this consistent performance of women would tend to raise the overall GPA achieved by women students. Secondly, women are more apt to come from homes of higher socioeconomic levels than do men, and larger numbers of men with lower abilities, limited funds and lower socioeconomic background attend college (Cross, 1968). This would tend to lower the overall GPA achieved by men students.

This review of the literature has demonstrated the trend of increasing enrollments of returning women students and produced ample evidence of their superior academic performance. The societal factors contributing to these developments have been stressed in order to better understand some of the reasons behind the increased enrollment of returning women students and their higher level of academic achievement. This practicum was designed to see if the same phenomena were evident at Black Hawk College.

METHODS OF STUDY

Definition of Terms

For the purposes of this study returning women students were operationally defined as those women, twenty-five years of age or older, who either entered marriage or the job market immediately upon graduation from high school, or interrupted their college educations for marriage and the raising of children. Achievement, or academic success was defined as the mean grade point average achieved by returning women students.

Procedures for Collecting and Treating Data

The first objective to demonstrate that the enrollment of returning women students was continuing to increase at Black Hawk College was accomplished with the following methods:

1. The fall of 1975 "Reports on Enrollment Prepared for the Illinois Board of Higher Education/Illinois Community College Board" (Appendix, Documents II and III) were compared with current enrollment data for the fall of 1976 (Appendix, Document IV).
2. No attempt was made at statistical analysis; the results were reported in terms of percentage increases.

The second objective, stated as a hypothesis, was to illustrate that the mean GPA achieved by returning women students was greater than the mean GPA achieved by the student body as a whole. This was carried out with the following procedures:

1. A list was compiled by the data processing center of all women, twenty-five years of age or older, who were enrolled

in degree programs for the fall semester, 1976, on the Quad-Cities Campus. This list only included those women who had taken a previous course or courses at the college and achieved a GPA.

2. A mean GPA was calculated on all women students meeting the above requirements, and it was compared with the mean GPA of the overall student body (excluding the females above) who were enrolled in degree programs on the Quad-Cities Campus (Appendix, Documents V and VI).
3. A statistical analysis was used to determine if there was a significant difference between the mean GPA's achieved. Contrary to the original proposal, the null hypothesis was tested with a z-test because of the size of the population studied. The level of significance was at .05, and the two-tailed critical value of z was utilized as it is a more conservative test. A one-tailed test would only have exaggerated the results of the study (Appendix, Documents VII a and VII b). If the calculated value of z exceeded the critical value of z then the null hypothesis was to be rejected. The original hypothesis would then be accepted. In order to avoid the TYPE TWO ERROR of failing to recognize a significant difference which may be present, the .05 level of significance was used foranalyzing the data in this study.

Limitations and Basic Assumptions of the Study

One limitation of the study was that the population was based on only those students currently enrolled on the Quad-Cities Campus

and this limited the external validity of the study. One basic assumption of the study, however, was that this population was academically similar to previous student enrollments on the Quad-Cities Campus.

Another limitation of the study was that many students failed to report their age in registering for courses and these students had to be eliminated from the sample. It was assumed that these students would have been equally distributed throughout the population and their exclusion would not significantly influence the results of the study.

FINDINGS OF THE STUDY

As Table I shows, there was little change in the overall student enrollment between the fall of 1975 and the fall of 1976. The total population increased 0.6 percent. The ratio between women and men was 52.8 percent to 47.2 percent respectively in 1975, and 52.3 percent to 47.7 percent respectively in 1976. This represented a 0.5 percent decrease for women and an 0.5 percent increase for men.

Table I

Comparative Analysis of the Enrollment Data from the Fall of 1975 with the Enrollment Data from the Fall of 1976.

Populations	Numbers		Percentages		Percent of Increase or Decrease
	1975	1976	1975	1976	
Women	3996	3982	52.8	52.3	-0.5
Men	3570	3632	47.2	47.7	+0.5
Total	7566	7614			+0.6

Table 2 shows, however, that while the overall population remained relatively stable, the known population of returning women students, age twenty-five years or older, increased by 2.2 percent.

Table 2

Comparative Analysis of the Growth of the Known Female Population that was twenty-five years of Age or Older from the Fall of 1975 to the Fall of 1976.

	1975	1976
Total of Known Women	2488	3051
Number 25 yrs. or older	1043	1346
Percentage 25 yrs. or older	41.9	44.1
Percentage increase between 1975 and 1976	2.2	

As Table 3 shows, the mean GPA achieved by returning women students was significantly higher than the mean GPA achieved by the rest of student body. The difference was significant at the.01 level. Therefore, the null hypothesis was rejected.

An additional statistical analysis of the differences in standard deviation was significant at the .05 level. This analysis revealed that there was not as much variation in GPA among women, twenty-five years of age or older, as in the general population (Appendix, Document VII a).

Table 3

The Mean GPA Achieved by Returning Women Students as Compared to the Mean GPA Achieved by the Rest of the Student Body.

	N	Mean	S. D.	Z
Returning Women	1727	3.284	.698	19.9*
Student Body	7786	2.909	.746	

*Difference significant at the .01 level.

CONCLUSIONS AND RECOMMENDATIONS

Enrollment Trends

Although the overall population of the student body at Black Hawk College remained relatively stable between the fall of 1975 and the fall of 1976, and did not come close to the national projected enrollment increase of 7.9 percent for two-year colleges, the 2.2 percent increase for returning women students is indicative of the national trends. This study has indeed identified a growing new constituency for the college.

Whereas there was no decrease in head count for the overall student body, an interview with Terry Kramer, Research Analyst, (November 12, 1976) revealed that student hours were down. Previous research (Beausang, 1976) revealed that significant numbers of returning women students would prefer more convenient scheduling of classes. Tighter time blocks, only one or two sessions a week, and mid-day hours while children are in school might encourage these women to increase their course load; thereby increasing student hours for the college.

Even though enrollments for women are increasing, studies illustrate (Carnegie Commission, 1973, Huston, 1976) that they are still predominantly entering traditionally "female" fields. Beausang (1976) illustrated that this was also true of women at Black Hawk College. Improved vocational counseling could aid this increasing population of women students. Women could up-grade their occupational and economic potential by changing their educational goals.

This study and others have clearly demonstrated the increasing

enrollments of returning women students. The time has now come for turning our attention towards planning worthwhile educational programs for these new learners (Cross, 1976).

Academic Achievement

The superior academic achievement of returning women students was also well substantiated by the results of this practicum. The performance of Black Hawk College women was very similar to previous research cited earlier in this paper. Even though the .05 level of significance was selected for the statistical analysis of this study, the fact that the results were significant at the .01 level further strengthens the findings.

This strong academic achievement of returning women students should serve as an incentive to counselors and faculty members of Black Hawk College to encourage the entrance of these women into non-traditional fields. The findings of the Carnegie Commission (1973) that the academic performance of women exceeds men in all fields should further document this recommendation.

A residual finding, produced by the statistical analysis of the differences in standard deviation, revealed that women were more consistent than men in their overall academic performance. This result also suggests that women should be encouraged to enter a variety of fields.

Recommendations for Further Study

Now that the increasing enrollment trends of returning women students and their superior academic achievement have been well documented, the following areas related to their needs should be

researched:

1. An investigation of the curriculum needs of returning women students should be undertaken.
2. Delivery systems that best meet the needs of returning women students should be studied.
3. The effects of higher education on a woman's personal and social life should be investigated.

Summary

The return of adult women students is anestablished phenomenon, and it clearly illustrates how higher education has been affected by the women's movement. Black Hawk College and other community colleges must be sensitive to the social factors influencing this movement, and they must support women in their attempt to achieve equality. As one source indicates:

> Although a majority, women have suffered from educational, vocational and economic discrimination as have such minorities as blacks, native Americans, and Spanish-speaking groups. And, like them, women have joined together to voice their protests against this discrimination. Our society can no longer afford to ignore or suppress the endeavors of over one-half of the population. It is past time to realize the historical, economic, vocational and social inequities being perpetuated between the sexes and through this education eliminate them. (Barabas, 1972:iii).

Results from another study suggest that, even though a woman's return to school is a self-initiated attempt at change prompted by internal needs and motives, there is still a great need for a supporting interpersonal environment (Markus, 1973). It has been clearly demonstrated that when an adult attempts change, the immediate social environment is very important to the outcome, of that change (Brim, 1968). Therefore, it is imperative that the faculty, staff, and

administration of Black Hawk College, along with a woman's family and friends, are supportive of her return to higher education.

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APPENDIX

Enrollment Data for Fall, 1976, Quad-Cities Campus

Women	3982	=	52.3
Men	3632	=	47.7
Total	7614	=	100.0

Percentage of the known female population that was twenty-five years of age or older was 44.1 percent.

The 1976 "Reports on Enrollment Prepared for the Illinois Board of Higher Education/Illinois Community College Board" were not completed at the writing of this paper. Therefore, this data was obtained from Terry Kramer, Research Analyst, who is in charge of preparing these reports for the college.

BEAUSANG SURVEY KENBEA,USR

GENERAL INFORMATION:

THIS PROGRAM WAS WRITTEN UPON THE REQUEST OF KENNETH BEAUSANG, A FACULTY MEMBER. IT IS A SURVEY PROGRAM USING ONLY QUAD CITY, DEGREE PROGRAM STUDENTS. A MEAN IS CALCULATED ON ALL FEMALE STUDENTS 25 YEARS OF AGE OR OLDER MEETING THE ABOVE REQUIREMENTS, AS WELL AS A MEAN OF THE OVERALL STUDENT BODY (EXCLUDING THE FEMALES MENTIONED ABOVE) ALSO MEETING THE QUAD CITY, DEGREE REQUIREMENTS. A STANDARD DEVIATION IS CALCULATED FOR EACH GROUP ALSO.

THE MEAN IS CALCULATE USING THE FOLLOWING EQUATION:

X = GPA
N = NUMBER OF STUDENTS

$$\frac{\Sigma x}{n}$$

THE STANDARD DEVIATION IS CALCULATED USING THE FOLLOWING EQUATION:

X = GPA
N = NUMBER OF STUDENTS

$$\sqrt{\frac{n\Sigma x^2 - (\Sigma x)^2}{n^2}}$$

TOTAL FEMALES 25 OR OLDER	1,727	MEAN	3.284	STND DEVIATION	0.696
TOTAL STUDENTS (EXCLUDING ABOVE FEMALES)	7,786	MEAN	2.909	STND DEVIATION	0.746

**** THIS SURVEY IS BASED ON QUAD CITY STUDENTS IN DEGREE PROGRAMS

BLACK HAWK COLLEGE 6600 34th Avenue Moline, Illinois 61265 309/796-1311

November 8, 1976

Mr. Kenneth Beausang
Black Hawk College
Moline, Illinois 61265

Dear Ken,

I have reviewed the results that you have provided:

1727 items in sample with $\mu = 3.284$ and $\sigma = .698$

7786 items in population excluding sample with $\mu = 2.909$ and $\sigma = .746$.

1) Our first concern is whether or not the differences in standard deviation is significant.

$$F = \frac{\sigma_1^2}{\sigma_2^2} = \frac{.746^2}{.698^2} \doteq 1.14$$

is significant at $\alpha = .05$. Hence there is not as much variation in GPA among women over 25 as in the general population.

2) Secondly, I observe that you have this set up as a two sample test for difference in mean...that is,

$$Z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}} = \frac{3.284 - 2.909}{\sqrt{\frac{(.698)^2}{1727} + \frac{(.746)^2}{7786}}} = \frac{.375}{.0188} \doteq 19.943 \sim 19.9$$

Z is critical at $1.96\,\sigma_{\bar{x}_1 - \bar{x}_2}$. The difference observed is significant.

3) If you wish to consider this sample from the pooled population, we would need an estimate for the standard deviation of the population. Since in step one we note the difference to be significant in standard deviations, then I suggest that we select the larger as the better indicator of general performance...at least this is the conservative estimator. The weighted mean for the general population is:

$$\frac{1727(3.284) + 7786(2.909)}{1727 + 7786} = \frac{28320.942}{8958} = 3.162$$

The standard error is:

$$\frac{\sigma}{\sqrt{n}} \cdot \sqrt{\frac{N-n}{N-1}} = \frac{.746}{\sqrt{1727}} \sqrt{\frac{7786}{8957}} \doteq .017$$

Calculated $z = \frac{\bar{x} - \mu}{\bar{x}} = \frac{3.284 - 3.162}{.017} = \frac{.122}{.017} = 7.289$

z is critical at 1.96

4. If your hypothesis happens to be directional... at $\alpha = .05$ you have only exaggerated the results... z would be critical at a value less than 1.96

5. I appreciate the opportunity to be of assistance and extend to you my offer to generally be supportive of your efforts. Please feel welcome to call again.

Sincerely

Philip M. Beckman

Philip M. Beckman
Mathematics/Statistics

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